

## ABSTRACT

### METHODS AND APPARATUS FOR IMAGING USING A LIGHT GUIDE BUNDLE AND A SPATIAL LIGHT MODULATOR

Endoscopes and other viewing devices that control the light that contacts a sample and/or that is detected emanating from a sample. The viewing devices are particularly well suited for *in vivo* imaging, although other uses are also included. The viewing devices, and methods related thereto, comprise a spatial light modulator in the illumination and/or detection light path so that light transmitted to the target via a bundle of light guides or optical system is transmitted substantially only into the cores of the light guide bundle and not into the cladding surrounding the light guides, filler between the light guides in the bundle, or undesired light guides. Also, methods and apparatus for mapping the pixels of the spatial light modulator to the cores of the light guides in the bundle (preferably at least 3 pixels (e.g., at least 3 mirrors for a digital micromirror device) for each core), as well as for mapping the light guides of one light guide bundle to another.